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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/698,267	10/31/2003	Robert L. Goldsmith	19642-00023	1670
28534 7590 05/09/2007 MIRICK, O'CONNELL, DEMALLIE & LOUGEE, LLP 1700 WEST PARK DRIVE WESTBOROUGH, MA 01581			EXAMINER MENON, KRISHNAN S	
			ART UNIT 1723	PAPER NUMBER
			MAIL DATE 05/09/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/698,267

Applicant(s)

GOLDSMITH, ROBERT L.

Examiner

Krishnan S. Menon

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 2,3,5-7 and 9-11 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2,3,5-7 and 9-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

### **DETAILED ACTION**

Claims 2,3,5-7 and 9-11 are pending as amended 1/3/07.

#### ***Terminal Disclaimer***

The terminal disclaimer filed on 11/16/06 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of 10/676,671 has been reviewed and is accepted. The terminal disclaimer has been recorded.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2,3,5-7 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rajnik et al (US 6,077,436) in view of Goldsmith et al (US 4,781,831); or alternately, Goldsmith in view of Rajnik

Claim 9: Rajnik teaches a process of separating a feed stock into permeate and retentate using a sweep gas flow from one end to the other as claimed (see abstract which teaches two sets of passages extending the longitudinal axis, with feed stream in one passage and the output stream in the other; column 6 lines 38-43, column 11 lines 16-23). Rajnik teaches a cross-flow membrane device (see figures) for the process

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having a ceramic monolith support (column 3 lines 55-60), plurality of longitudinal passages for feed and gas-phase permeate (column 4 lines 1-10; column 5 lines 30-48), a membrane coated on the feed side walls (column 6 lines 14-25), permeate conduits in the monolith (see figures, column 4 lines 1-17), and means for permeate separation, withdrawal and sweep gas (the parallel set of channels are for feed and permeate as in column 4 lines 39-47 and column 5 lines 30-48; column 6 lines 38-43). The means-plus-function language in the claim would invoke 35 USC 112, sixth paragraph, and accordingly, the claimed means would be what is specified or equivalents thereof.

Rajnik does not teach a housing assembly with associated connection ports to contain the element as in claims 9, 6 and 7. However, such a housing would be implied, since the element is not usable without a housing and associated connection ports. "[I]n considering the disclosure of a reference, it is proper to take into account not only specific teachings of the reference but also the inferences which one skilled in the art would reasonably be expected to draw therefrom." In re Preda, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968); In re Lamberti, 545 F.2d 747, 750, 192 USPQ 278, 280 (CCPA 1976). Regarding the channels communicating with inlet and outlet ports, Rajnik teaches egress channels (4) running the entire length of the element (1), with outlet holes (5); thus there can be outlet holes (5) close to both ends of the element, and channels (4) seem to open at the end faces as well – with respect to figure 2 and 2a, column 8 lines 53-65. Other figures in Rajnik also have similar structures.

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Goldsmith teaches a housing with feedstock inlet, retentate outlet, etc – see figure 1. The means for sealing the permeate and sweep gas flows from the feedstock and retentate flows is means 10 in applicant's specification. This limitation invokes 35 USC 112, sixth paragraph. Therefore, the means can be what is in the specification or equivalent thereof. Means 10 in applicant's figures appear to be a gasket seal; Goldsmith provides O-ring seals (56) which are equivalent. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Goldsmith in the teaching of Rajnik to have the housing to use the membrane element taught by Rajnik. The need for the sweep gas inlet and permeate/sweep gas outlet, even if not shown in the references, would be obvious to one of ordinary skill.

With respect to the newly added limitation of "... sweep fluid flows substantially through the entire length of the permeate chambers without encountering an egress to the external surface...", Rajnik teaches in column 4 lines 36-61 that the 'egress conduits' (which are the longitudinal permeate or filtrate channels in Rajnik) can be manifolded to the outside structure for the application as desired. How these connections can be established is well known in the arts of pervaporation and gas separation – see the following references as evidence:

Reddy , US 5,096,584; Friesen et al, US 5,108,464; Makino et al, US 4,718,921.

Claims 2 and 3: single monolith or monolith segments: column 4 lines 18-36

Claim 5: permeate channels at end faces – see column 8 lines 53-65 – egress channels. Channels are slots – see figures.

Claim 10 and 11: sweep gas inlet port and outlet port for co-current or counter-current flow: providing sweep gas is taught by Rajnik, which flows from one end to the other as seen in column 11 lines 16-23. Co-current or counter-current flows would be equivalent since the permeate stream leaving the membrane would be of the same composition in either flow, and need for the sweep gas is to reduce the partial pressure of the permeate gas, which is not affected by the direction of flow. The apparatus is capable of flow in either direction.

Alternate Rejection: Goldsmith teaches the structure of the membrane as recited with the monolith, and the housing – see figures 1 and 7, which show the permeate egress channels at the feed and retentate ends of the monolith (column 12 lines 3-35). Goldsmith differs from the claims in having the connections for the sweep fluid, which is taught by Rajnik. It would be obvious to one of ordinary skill in the art at the time of invention to use the teaching of Rajnik in the teaching of Goldsmith so that the Goldsmith device can be modified for more functionalities such as supply of sweep gas for pervaporation or gas separation, or reactive gases – see Rajnik column 6 lines 38-43.

Modification of elements for submitting sweep gas for pervaporation or gas separation is well known in the art, and is therefore, not patentable. Providing inlet and outlet connections in a membrane module for the sweep gas is also within the skill level of one of ordinary skill in the art, and is not a patentable limitation, as shown by the additional references listed above.

### ***Response to Arguments***

Applicant's arguments filed 4/23/07 have been fully considered but they are not persuasive.

Arguments about sweep fluid inlet and outlet ports, and that the references do not teach that substantially all the sweep fluid flows through the entire length of the membrane: Rajnik implies limiting the egress conduits to the minimum necessary – see column 8 lines 28-65. Rajnik teaches the holes (5) for manifolding the egress conduits. Even if Rajnik is construed as not teaching it, one of ordinary skill in the art would have sufficient knowledge and/or information to provide the locations and the number of such holes for manifolding for the purpose of providing sweep gas, as shown by the additional evidences presented. Rest of the arguments about Rajnik in this regard is not commensurate in scope with the rejection. Arguments about variations in the design and additional embodiments taught in Rajnik would not overcome the prima facie case of rejection.

#### **Dr. Goldsmith's Declaration:**

The Examiner acknowledges Dr. Goldsmith's accomplishments. However, the declaration is insufficient to show any long felt need for the claimed invention. On the contrary, the declaration only shows that providing sweep fluid is well known in the art.

### ***Conclusion***

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This is an RCE. All claims are drawn to the same invention claimed in the earlier application and could have been finally rejected on the grounds and art of record in the next Office action if they had been entered in the earlier application. Accordingly, **THIS ACTION IS MADE FINAL** even though it is a first action in this case. See MPEP § 706.07(b). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no, however, event will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Krishnan S Menon  
Primary Examiner  
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